UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/640,963	08/16/2000	Aki Shohara	020669-00200US	3410

			EXAMINER
23363	7590	05/20/2004	TRAN, KHANH C

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ART UNIT	PAPER NUMBER
2631	6

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.		Applicant(s)
	09/640,963		SHOHARA, AKI
	Examiner		Art Unit
	Khanh Tran		2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _____.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-43* is/are pending in the application.
   4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) *19 and 20* is/are allowed.
6) ☒ Claim(s) *1-18 and 21-42* is/are rejected.
7) ☒ Claim(s) *43* is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All   b) ☐ Some * c) ☐ None of:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____.
   3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)
1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____ .

DETAILED ACTION

1. The Amendment filed on 02/18/2003 has been entered. Claims 1-43 are

pending in this Office action.

Response to Arguments

2. Applicant's arguments with respect to claims 21-42 have been considered but

are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 3, 8 are rejected under 35 U.S.C. 112, first paragraph, because the

specification, while being enabling for "k" (see page 6, lines 23-30 of the specification),

does not reasonably provide enablement for k. The specification does not enable any

person skilled in the art to which it pertains, or with which it is most nearly connected, to

make and use the invention commensurate in scope with these claims.

Regarding claims 1, 3, 8, k are undefined in the claims.

4. Claim 13 is rejected under 35 U.S.C. 112, first paragraph, because the

specification, while being enabling for "*k and ℓ*" (see page 6 line 23 through page 7 line

15, of the specification), does not reasonably provide enablement for k and i. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Regarding claim 13, k and i bit are undefined in the claim.

5. Claim 15 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for "*k and L*" (see page 6 line 32 through page 7 line 15, of the specification), does not reasonably provide enablement for k and L. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Regarding claim 15, k and L are undefined in the claim.

6. Claim 16 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for "*k, n and L*" (see page 6 line 32 through page 7 line 15, of the specification), does not reasonably provide enablement for k and n. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Regarding claim 16, k, n and L are undefined in the claim.

7. Claims 17-18 are rejected under 35 U.S.C. 112, first paragraph, because the

specification, while being enabling for "*i*" (see page 6 line 23 through page 7 line 15, of

the specification), does not reasonably provide enablement for i. The specification does

not enable any person skilled in the art to which it pertains, or with which it is most

nearly connected, to make and use the invention commensurate in scope with these

claims.

Regarding claims 17-18, i bit are undefined in the claim.

8. Claims 2, 4-7 are also rejected due to dependency on claim 1.

9. Claims 9-12 are also rejected due to dependency on claim 8.

10. Claim 14 is also rejected due to dependency on claim 13.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 21-32, 34-42 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Van Den Berghe et al. U.S. Patent 6,233,713 B1.

Regarding claim 21, see in column 6, lines 13-47, Van Den Berghe et al.

discloses a method for storing puncture code index in the code book and linking

the code book to the code book table. The puncture code index may be used to

obtain and read the actual bits of a particular puncture code. Van Den Berghe et

al. does not expressly disclose compressing a puncture masks as claimed in the

pending patent application. However, by using a puncture code index which is

representative of a particular puncture code, it would have been obvious for one

of ordinary skill in the art that the puncture code is equivalently stored in a

compressed form in the code book, which is stored in the memory 502 (see

figure 4), corresponding to the claimed stored compressed puncture mask

electronically.

The puncture code is defined in Van Den Berghe et al. invention as a

string of 1s and 0s mapping a periodic sequence of output bits from a

convolutional encoder to a punctured sequence of those bits. A "0" indicates that

a particular bit is punctured, not transmitted. In light of the foregoing teachings,

the puncture code in Van Den Berghe et al. invention corresponds to the claimed

puncture mask as set forth in the claim.

Regarding claim 22, Van Den Berghe et al. does not expressly disclose the

puncture code is specifically at least 1000 bits before compressing. Nevertheless, Van

Den Berghe et al. discloses in the invention the puncture codes may be quite large and

use a lot of memory for each code. Hence, as appreciated by one of ordinary skill in the

art in light of the teachings, the puncture code in Van Den Berghe et al. invention could be at least 1000 bit as claimed. Furthermore, depending on particular applications in wireless communications, the number of bits of a puncture code is a matter of designing choice.

Regarding claim 23, using analogous reasoning, said claim is rejected on the same ground as claim 22.

Regarding claim 24, Van Den Berghe et al. invention is described with reference to GSM G.723.1. Van Den Berghe et al. does not disclose that the puncture masks from at least two communication standards are compressed. Since only puncture code index associating to a particular puncture code is stored in the code book, and is used to obtain and read the actual bits of that particular puncture code, it would have been obvious for one of ordinary skill in the art that puncture codes from two different communication standards could be stored and retrieved the same way because the method is transparent to any communication standard.

Regarding claim 25, GSM G.723.1 Annex C disclosed Van Den Berghe et al. invention uses 24 puncture codes. However, employing more than 30 puncture codes would have been obvious for one of ordinary skill in the art because it will not change the principle operation of Van Den Berghe et al. method.

Regarding claim 26, as recited in claim 21, the puncture code index is stored in the memory 502, corresponding to the claimed semiconductor memory.

Regarding claim 27, as recited in claim 21, by retrieving a puncture code index from the code book, the actual bits of a particular puncture code associating with the puncture code index can be read out, which is equivalent to the claimed decompressing the compressed puncture mask.

Also, the puncture code is defined in Van Den Berghe et al. invention as a string of 1s and 0s mapping a periodic sequence of output bits from a convolutional encoder to a punctured sequence of those bits. A "0" indicates that a particular bit is punctured, not transmitted. In light of the foregoing teachings, the puncture code in Van Den Berghe et al. invention corresponds to the claimed puncture mask as set forth in the claim.

Regarding claim 28, using analogous reasoning, said claim is rejected on the same ground as claim 22.

Regarding claim 29, using analogous reasoning, said claim is rejected on the same ground as claim 23.

Regarding claim 30, using analogous reasoning, said claim is rejected on the same ground as claim 24.

Regarding claim 31, using analogous reasoning, said claim is rejected on the same ground as claim 25.

Regarding claim 32, as recited in claim 27, the puncture code is defined in Van Den Berghe et al. invention as a string of 1s and 0s wherein a "0" indicates that a particular bit is punctured, not transmitted, and a "1" corresponds to bit being transmitted. As appreciated by one of ordinary skill in the art, the "0" is equivalent to the claimed first polarity. Meanwhile, a "1" obviously corresponds to the claimed second polarity.

Regarding claim 34, as recited in claim 21, Van Den Berghe et al. disclose a method of storing puncture code indexes, associating with puncture codes, in a code book. The code book is stored in a memory 502. The puncture code index may be used to obtain and read the actual bits of a particular puncture code. As well known in the art of semiconductor, it would have been obvious for one of ordinary skill in the art that the memory 502 could be implemented on an integrated circuit as claimed in the pending patent application.

The puncture code is defined in Van Den Berghe et al. invention as a string of 1s and 0s mapping a periodic sequence of output bits from a convolutional encoder to a punctured sequence of those bits. A "0" indicates that a particular bit is punctured, not transmitted. In light of the foregoing teachings,

the puncture code in Van Den Berghe et al. invention corresponds to the claimed

puncture mask as set forth in the claim.

Regarding claim 35, figure 4 illustrates a transmitter including memory 502 for

wireless communications.

Regarding claim 36, using analogous reasoning, said claim is rejected on the

same ground as claim 22.

Regarding claim 37, using analogous reasoning, said claim is rejected on the

same ground as claim 23.

Regarding claim 38, using analogous reasoning, said claim is rejected on the

same ground as claim 24.

Regarding claim 39, using analogous reasoning, said claim is rejected on the

same ground as claim 25.

Regarding claim 40, figure 4 does not show the receive path including at least a

portion of a mixer. As well known in the art of wireless communications, a transmitter

always includes a receive path including a portion of a mixer, which is part of RF

demodulation.

Regarding claim 41, figure 4 illustrates a transmitter, but does not show the

claimed mixer. However, as well known in the art of wireless communications, the mixer

is included in a modulator/transmitter 110 for up-converting transmit signal to RF

frequency.

Regarding claim 42, figure 4 does not show a portion of a VCO. Nevertheless,

official notice taken, the transmitter in figure 4 includes the claimed VCO.

12. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van

Den Berghe et al. U.S. Patent 6,233,713 B1 in view of admitted prior art.

Regarding claim 33, as recited in claim 27, the puncture code is defined in

Van Den Berghe et al. invention as a string of 1s and 0s mapping a periodic

sequence of output bits from a convolutional encoder to a punctured sequence of

those bits. Van Den Berghe et al. does not disclose the step of reading as set

forth in the claim. Nevertheless, as appreciated by one of ordinary skill in the art

that the mapping process is a one-to-one mapping that would include the steps

of reading output bits one bit at a time, reading the puncture code one bit at a

time as claimed in the pending application.

Van Den Berghe et al., however, does not disclose inserting an erasure

and not inserting an erasure as claimed in the pending patent application.

Admitted prior art discloses in the pending application, a zero indicates a position

where an erasure is to be inserted, which corresponds to a first polarity, and a

one indicates a position where an erasure is not to be inserted, which corresponds to a second polarity. Since utilizing an erasure is well known in the art for deleting a sequence bit corresponding to the "0" position and, therefore, it would have been obvious for one of ordinary skill in the art to modify Van Den Berghe et al. method to incorporate an erasure as taught by admitted prior art for deleting bits in a sequence corresponding to the "0" positions.

Allowable Subject Matter

13. Claim 43 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. Claims 19-20 are allowed.

Regarding claim 19, said claim is directed to a code puncture apparatus. The prior art of record does not teach or suggest the claimed limitations "a run length decoder ..." and "a differential operator ..." and "a puncture mask register ...".

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Song U.S. Patent 5,987,067 discloses "Variable Encoding Rate Puncturer".

How et al. U.S. Patent 5,511,082 discloses "Punctured Convolutional Encoder".
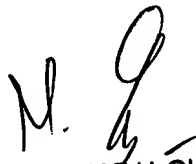
Laskowski U.S. Patent 5,790,566 discloses "Method and Device for

Depuncturing Data".

16. Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Khanh Tran whose telephone number is 703-305-

2384. The examiner can normally be reached on Tuesday - Friday from 08:00 AM -

05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Mohammad Ghayour can be reached on 703-306-3034. The fax phone

number for the organization where this application or proceeding is assigned is 703-

872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

KCT

MOHAMMAD H. GHAYOUR
PRIMARY EXAMINER